WHAT IS CLAIMED IS:

1. A three-dimensional ultrasonographic device, comprising:

an ultrasonic transducer composed of a plurality of piezoelectric vibrators;

a vibrator selecting part which causes an arbitrary one of the plural piezoelectric vibrators to generate an ultrasonic wave;

a signal detecting circuit which selectively detects electrical signals that the plural piezoelectric vibrators generate when receiving echoes of the ultrasonic wave, which is generated by the piezoelectric vibrator selected by said vibrator selecting part to be reflected on an inspection object via an acoustic medium;

a signal processing part which generates three-dimensional imaging data by aperture synthesizing from the electrical signals detected by said signal detecting circuit, in correspondence to meshes in a three-dimensional imaging area set in the inspection object; and

a display processing part which has: a function of changing brightness or transparency of respective meshes in the three-dimensional area, according to values of the three-dimensional imaging data generated by the signal processing part, that the respective meshes have for the three-dimensional imaging data; and a function of applying masking or image brightness correction to an image of an unnecessary portion of the three-dimensional imaging data, by multiplying the value of the three-dimensional imaging data by a value set according to a three-dimensional coordinate position (X, Y, Z).

2. The three-dimensional ultrasonographic device as set forth in claim 1,

wherein said display processing part comprises

a two-dimensional image generating part which sees through the three-dimensional imaging data from three directions straight to one another and projects, on a two-dimensional plane, data with the largest value out of imaging data stacked in each of the see-through directions out of the three-dimensional imaging data to thereby generate three two-dimensional images in the respective three directions.

3. The three-dimensional ultrasonographic device as set forth in claim 2, comprising:

an abnormality judging/displaying part which compares the values of the three-dimensional imaging data corresponding to the meshes in an area of each of the two-dimensional images generated by said two-dimensional image generating part with a predetermined set value to find the mesh whose value is equal to or larger than the set value, and compares three-dimensional coordinates of the found imaging mesh with preset three-dimensional shape information on an outline shape of the inspection object or on a post-processed portion, thereby detecting whether or not an interference between a defect position and the post-processed portion exists in the inspection object to display a result of the detection.

4. The three-dimensional ultrasonographic device according to claim 3, comprising:

an abnormality judging/displaying part which, when the imaging mesh whose value exceeds the predetermined set value is selected by said two-dimensional image generating part,

automatically calculates an area of an abnormal portion based on an adjacency state of the selected imaging mesh and judges whether or not the automatically calculated area of the abnormal portion is equal to or larger than a prescribed value to display a result of the judgment.

5. The three-dimensional ultrasonographic device as set forth in claim 2, further comprising:

an outline drawing part which draws an outline of a shape of the inspection object so as to overlay the outline on the three two-dimensional images generated by said two-dimensional image generating part.

6. The three-dimensional ultrasonographic device as set forth in claim 1, further comprising:

an outline drawing part which draws three-dimensional shapes of an outline of the inspection object and a post-processed portion, by overlaying the three-dimensional imaging data generated by said signal processing part on the three-dimensional imaging area.

7. The three-dimensional ultrasonographic device as set forth in claim 1, further comprising:

an abnormality judging part which compares the values of the three-dimensional imaging data corresponding to the meshes in the three-dimensional imaging area with a predetermined set value to output the mesh whose value is equal to or larger than the set value, and automatically calculates a ratio of the number of the outputted meshes whose values are equal to or larger than the set value to judge that abnormality exists when an automatically calculated value becomes equal to or larger than a prescribed value.

8. The three-dimensional ultrasonographic device as set

forth in claim 1, comprising:

an abnormality judging/displaying part which compares the values of the three-dimensional imaging data corresponding to the meshes in the three-dimensional imaging area with a predetermined set value to output the mesh whose value is equal to or larger than the set value, and compares three-dimensional coordinates of the outputted mesh with preset three-dimensional shape information on an outline shape of the inspection object and on a post-processed portion, thereby detecting whether or not an interference between a defect position and the post-processed portion exists in the inspection object to display a result of the detection.

9. The three-dimensional ultrasonographic device as set forth in claim 8, comprising:

a unit which, when said abnormality judging/displaying part outputs the mesh whose value is equal to or larger than the set value from the three-dimensional imaging data, automatically calculates a volume of the abnormal portion based on an adjacency state of the outputted imaging data and judges whether or not an area of the abnormal portion is equal to or larger than a predetermined value to display a result of the judgment.

10. The three-dimensional ultrasonographic device as set forth in claim 1, comprising:

a mechanism part which mechanically drives said transducer and detects a movement position of said transducer;

an image connecting part connecting the plural imaging data that are detected each time said transducer is moved by said mechanism part; and

a display part displaying images connected by said image

connecting part.

11. The three-dimensional ultrasonographic device as set forth in claim 1, further comprising:

a masking part which has an aperture at a position corresponding to the inspection area and which covers a surface of the inspection object, with the aperture being set on the inspection area of the inspection object.

12. The three-dimensional ultrasonographic device as set forth in claim 1,

wherein the plural piezoelectric vibrators composing said ultrasonic transducer are arranged in a matrix.

13. The three-dimensional ultrasonographic device as set forth in claim 1,

wherein the plural piezoelectric vibrators composing said ultrasonic transducer are arranged in line.

14. The three-dimensional ultrasonographic device as set forth in claim 1,

wherein said acoustic medium is solid.

15. The three-dimensional ultrasonographic device as set forth in claim 1,

wherein said acoustic medium is liquid.

16. The three-dimensional ultrasonographic device as set forth in claim 1,

wherein the inspection object has a planar boundary.

17. The three-dimensional ultrasonographic device as set forth in claim 1,

wherein the inspection object has a curved boundary.

18. The three-dimensional ultrasonographic device as set

forth in claim 1,

wherein the inspection object is made of a layer having a single acoustic characteristic.

19. The three-dimensional ultrasonographic device as set forth in claim 1,

wherein the inspection object is made of a layer having a plurality of acoustic characteristics.